

EXHIBIT 7

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Forensic Neuropsychology

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Forensic Neuropsychological Evaluation

Demographic Information

Name: Sherrod, Emir DoB: 3/29/11 DoE: 6/28/2020
Age: 9:3 years old Education: 3rd grade

Referred by: Levy-Konigsberg LLP

Referral Question: Cognitive and emotional impact of lead exposure

Background

Emir Sherrod is a 9-year, 3-month-old, right-handed boy of African American ancestry. His mother's pregnancy with him was full-term, and he was born within normal size/weight limits (3000 g). His medical history is unremarkable. His parents have declined some vaccines, but otherwise, he is up to date on those. He has no known allergies. He takes no medications nor supplements.

On 12/16/11, Emir was seen by Dr. Dolven in pediatrics for frequent diaper rash as well as cold (all of the subsequent records were with this same pediatrics office, but generally with nurse practitioners). Treatments were started, and he had a follow-up on 12/22/11, which was unremarkable.

On 10/17/12, Emir was seen in pediatrics for conjunctivitis.

On 9/11/14, Emir had a well child visit. His temperament was noted to be "calm, happy, and independent." The visit was unremarkable. On 10/6/14, Emir was seen in pediatrics for a hot water scald/burn on his arm.

On 2/16/16, Emir had a negative capillary blood lead level of <3.3 µg/dl.

On 12/12/16, Emir was seen in pediatrics for coughing (it appears he and his brothers were all home due to a snow day, and they had all gotten sick) – he was taking amoxicillin and prednisolone at this time.

Emir appears to have had a laceration to his wrist in early 2018. On 3/7/18, Emir was seen in pediatrics for wrist suture removal, which was unremarkable.

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Pediatrics also provided height, weight, and BMI growth charts, for the age range 3-7 years, and all of these indicators were consistently normal.

Emir also had an 8/24/19 bone lead density assessment, with a result of 6.72 µg/g.

I also reviewed school records for Emir. During the 2016-2017 school year (kindergarten), Emir had good attendance (his teacher did complain about absence/tardy rate in the first marking period, but he missed only one school day that period, and only three altogether – whereas I do not see much discussion of his much higher absence rates in subsequent years). He was rated as satisfactory in all areas. There do not appear to be other concerns. During the 2017-2018, Emir was rated as satisfactory outside of not satisfactory ratings for writing in the third and fourth marking periods. He had a moderate number of absences (11 days). During the first two marking periods, he was noted to be a role-model for peers and diligent and independent, although in the third and fourth period, there were mild concerns with completing assignments. At the end of that school year, on 6/6/18, I did have a Dolch sight word list for him – his sight words through the second-grade level were reported – he was missing a few primer and first grade words, but he had about 90% of the Dolch words through first grade, and he had 85% of the words cumulatively through second grade. During the 2018-2019 school year, Emir was rated as satisfactory in all areas (outside of one marking period in which physical education was not satisfactory) and he was rated as having “good” citizenship. He was noted to actively participate in class. During the second marking period, his teacher noted difficulty with higher level mathematics, but this subsequently improved. He had a fairly high absence rate (20 days). I also had MAP reports to review, which covered the period from 2016-2019. Mathematics percentiles ranged from 33-74 during this period. Reading percentiles ranged from 31-79. Language usage percentiles in 2018-2019 ranged from 46-68.

I reviewed a plaintiff's fact sheet completed for Emir, signed 7/10/19, which alleged that he suffered “cognitive deficits, shame, ...aggressive behavior, loss of concentration, and an inability to focus.”

Finally, on 1/14/20, Ms. Wheeler was deposed. She indicated relocating to Flint, MI from Morris, MI around 4/2011. Ms. Wheeler rented a home in Flint and then purchased the same home 2-3 years later (per Ms. Wheeler, this was a “quitclaim” purchase for \$1), and they continued living there through the time of the deposition. The home is single-story with a crawl space. They reported that the house had been repainted 2-3 months prior to their moving in. She indicated that renovations included placement of new tile and a new toilet in the bathroom around 1½ after they took occupancy, and also new windows. Ms. Wheeler reported painting the room Emir shares with his brothers around 2016, with the children staying with family during painting. She denied any peeling or chipped paint. Emir was breastfed for about 6 ½ months and then fed formula through age 1 ½, using tap water for mixing the formula. Ms. Wheeler denied any early developmental concerns. The laceration noted in the medical records in 2018 occurred jumping off of back stairs, slipping on ice, and tearing his hand on a damaged screen door. She noted that Emir “enjoys jumping off of things. So, he tends to hurt himself a lot or scrape his knee or scrape his back or something of that nature.” She noted that he is “active every day all day.” He did not have any history of significant head injuries. She noted that he is “very talkative, very hyper,” but able to form friendships, although much of his socializing is with his cousins. On the other hand, she noted that Emir does request cousins to visit or to visit them, but when his cousins visit, Emir will “probably hook up a game for them, get them situated, but Emir will go off in his own corner in his own zone, whether it's with a tablet or just an action figure or something, or just to paint.” Academically, she noted that Emir had difficulties with reading and writing, including writing numbers backwards. When he was learning to write, he would be

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shown this several times and then forget and start making errors again. She noted that, in doing homework, Emir would “fly through it” and claim he had finished but had “skipped over six problems or seven problems.” Ms. Wheeler reported that she had not sought behavioral health care, but Emir’s father took him to see some type of behavioral specialist, because he was “very hyperactive and erratic and loud” (however, later, on cross examination, she reiterated that Emir had *not* seen a behavioral health specialist). Ms. Wheeler also noted that Emir developed skin rashes as a result of the water, and they began using topical creams prescribed during a hospital visit, for this. When the water system change occurred, Ms. Wheeler reported that the water was discolored and had a taste change. She noted that Emir’s older brother did comment when their grandmother cooked with “Flint water” (although she reported Emir’s grandmother used a water filter). They did continue drinking it until they received a letter, at some point in 2014, advising that the water was not safe. They then began purchasing bottle water until bottled water began being provided to them for free. At that point, they began to drink, cook, and wash with it, or they used baby wipes to clean themselves instead of using tap water. They began using water filters when these were distributed to them, approximately in 2015. Ms. Wheeler noted that they lacked confidence in the filters, because they lacked a way to assess whether or how well the filter was functioning. She reported that the water was “still bad” after reversion of the water supply to the Detroit river, and that at that time, she performed a home water test, but the results of this are not clear. She reported that, at the time of the deposition, their home water supply remained cloudy and that they continued to drink and cook with bottled water, but they had returned to using tap water to wash dishes and bathe/shower.

Interview

Emir was accompanied by his family to my office. I obtained parent informed consent directly, and his assent. I explained the medicolegal nature of this examination, including the limited doctor-patient relationship between the examinee and myself, and that as a result I would not be providing feedback or making recommendations today. This did take an extended amount of time – the family initially was unwilling to offer consent, but we did have an extended discussion, I offered to have them contact their attorney as needed, and ultimately they were satisfied and could voice understanding of what they were consenting to and provide credible consent without any duress. Assent was unremarkable. I evaluated the examinee in a private, quiet, 1:1 environment, per standardization guidelines.

I reviewed early developmental history in detail with the family. Emir was pretty good as a baby. He had good motor tone. Basic physical milestones were on-time. It was not hard for him to ride a bicycle, and he was riding without training wheels by 5-6 years of age. He can play catch. It was not hard for him to learn to tie shoelaces. He had normal infantile babbling. He was saying words around one year of age, and phrases somewhere around 2-3 years, and in general this was all fine. He had good infantile eye contact and joint attention, and he did not struggle to learn communicative facial affect. He was good at playing.

They started becoming concerned with attention when school started. He was in preschool at the Montessori and then he continued into school there. They said that he could focus at times, but at times he was off doing something else – his parents indicated this was relatively rare, though. Of note here, they expressed to me many times that they were very fearful of any kind of diagnosis or “label” affecting Emir adversely, and in any event, they did not seek any care for this. These focus problems are not something

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they have noticed as much, more recently. He can provide detailed recall from his verbal episodic memory. He tracks the days of the week. He tracks relative time. They think his reading and writing might not be as good – he struggles with comprehension, but this has gotten better.

Emir is good at climbing, doing flips, etc. He is in general quite athletic. He is generally pretty happy. He is not anxious – he is not a worrier. He might get into some minor tussles at school, but this does not sound like anything significant. He is able to make and keep friends. He does think he tries to be a good older brother to his younger brother. He is not a sore loser, but he will get mad if they skip him for his turn with the video games.

With physical symptoms, vision and hearing are fine. Emir is picky – sometimes he will not eat chicken or burgers, but he likes most vegetables and fruits. He sleeps pretty well in general – recently, they got the Gamepass to play Fortnite, and this has been a problem, because he stays up playing. He does not snore. He does still climb in his parents' bed sometimes. He does not seem to have pain problems.

Functionally, Emir will get himself dressed and get the others dressed, as well. He can pick out nice clothes, if needed. He does still wet the bed, sometimes. He can save money if he gets it. He can go out in the yard.

Observations

On informal observation, Emir was a smallish boy of normal build. He ambulated independently and did not demonstrate any motoric abnormality. He did seem a bit on the sluggish side, although this was mostly when I was testing him (at other times, he was playing video games, having snacks, etc., and his alertness seemed normal. He did not have any overt drowsiness or falling asleep. He did make well-modulated eye contact. Affectively, he was grossly euthymic. He did use a variety of means for social communication, including spontaneous descriptive and emphatic gestures. His speech was normal for rate, rhythm, prosody, and complexity of content, generally, although at times he was somewhat soft spoken, and I had to ask him to "speak up." When I did this, he was fully intelligible, and there were no signs of speech disorder. He can follow directions, but there were quite a few times when he would respond quizzically or "what?" to directions that were within context, and I did have to repeat myself at times, but not always. Expressively, he did not really have unusual intrusive errors or other things that were strange expressive speech, excepting that some of his wrong answers during reading comprehension testing were a little odd. During formal testing, he needed some coaxing and redirection, but at times he could also work independently (e.g., when being given the WRAT-5 mathematics, he did not need any redirection). He did acceptably on measures of effort in testing, and these results are deemed valid and interpretable.

Test Results

On a measure of overall intellectual functioning (WISC-V, FSIQ= 99), Emir performed in the average range, without significant discrepancy across domains on this instrument. He did acceptably on much of the remainder of testing, as well. In general, academic skills (WRAT-5) were also intact. Math was a bit lower than other areas, about a grade level behind expectations (but psychometrically low average). Here, however, it is notable that Emir had a very high error rate – he tried 26 items, and he only got 10 of these

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correct (38%). His errors did include “spatial” errors such as operator errors (subtracting instead of adding, etc.), carrying errors, and order-of-magnitude errors (that is, answers that are wildly inaccurate).

I looked at memory in detail. Initial learning was inefficient for both verbal and visual materials (CVLT-C, CVMT). With verbal information, recall generally remained low average (with one instance of benefitting from semantic cues, or hints, but not consistently – with SDCR but not LDCR). Recognition format did improve memory to the average range. It was somewhat the opposite with visual memory – initial learning was low average, but delayed recognition was borderline impaired (DR).

I also looked at frontal/executive functions in detail. Emir had generally acceptable speeded performance. He did have some mild inconsistency here – for instance, he did relatively more poorly on an easy visual scanning and sequencing task (TMT-A), improving on a more challenging version (TMT-B) requiring divided attention. This could be psychogenic and/or it may be more related to resource marshalling – that is, Emir is able to focus, but only when he perceives the situation is demanding. This latter explanation would fit with my behavioral observations. Also strengthening this explanation is that the same pattern was evident in attention testing. Basic, focused attention was good (DS). Emir was impulsive on the easier aspect of a sustained attention task (the AA component of NEPSY-2 AARS) – a test where children his age typically do not make many errors, but he did well on the more challenging component requiring vigilance and response inhibition (RS), performing above average. I believe this happened a third time, when I looked at multi-step problem solving (TOL-DX). Of note, when I showed him the easy “samples” for this test, he was stuck for an extended period of time on one of these – I showed him how to do it, and he reported to me that I had not set this up correctly (which would have made it much harder), although I do not think this is correct. Rather, I think this may have been an attentional lapse on his part, but in any event, once the actual test started, he did very well. He was perhaps very slightly impulsive (IT – psychometrically, it is not possible for this score to be impaired at Emir’s age, but he did begin items without appearing to think them through), but otherwise his performance was quite good. Overall, there are not pronounced cognitive deficits in any area, but there is a subtle pattern of problems with correctly assessing the difficulty of tasks and appropriately using this information to drive cognitive resource allocation and utilization, and I do think this is a subtle executive deficit for Emir.

I completed an assessment of adaptive functioning with the family (Vineland-3). This suggested solidly normal independence skills, with strong motor development. They did not describe many problem behaviors here. When I had them complete the BASC-3 to assess behavioral and emotional functioning more broadly, their profile did not raise concerns about bias in responding, and they did endorse some mild to moderate hyperactivity and mild aggression. Hyperactivity was rated as worse than 97% of age peers. Consistent with the Vineland-3, they rated positive / adaptive behaviors as well above average on the BASC-3.

Test Results, Tabulated

NV-MSVT

IR= 100.0	DR= 100.0	CNS= 100.0
DRA= 100.0	DRV= 100.0	PA= 100.0
FR= 70.0		

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WISC-V

Verbal	SI= 8	VC= 10
Vis/Spat	BD= 9	
Fl Reas	MR= 14	FW= 7
Wk Mem	DS= 12	(RDS= 7)
Pc Spd	CD= 9	
Indices	VCI= 95 FRI= 103 FSIQ= 99	

WRAT-5 (Blue, Age norms)

Word Reading= 97 (GE= 3.0)

Math Computation= 86 (GE= 2.5)

Sentence Comprehension= 95 (GE= 3.1)

GPT

R/Dom= 83", 0 drops, Z= -0.6

L= 76", 1 drop, Z= +0.3

TMT

A= 38", 0 err, Z= -1.3

B= 71", 1 err, Z= -0.6

CVMT

Hits= 41, 93rd %ile	FA= 22, 87 th %ile
d'= 2.28	Total= 73, 23 rd %ile
DR= 1, 10 th %ile	Disc= 7/7
SVT= 19	

CVLT-C

Trial 1= 4, Z= -1.0	Trial 5= 8, Z= -1.0
T1-5= 28, T= 31	Trial B= 4, Z= -1.0
SDFR= 7, Z= -0.5	SDCR= 10, Z= +0.5
LDFR= 7, Z= -1.0	LDCR= 7, Z= -1.0
Hits= 13, Z= 0.0	FP= 2, Z= -0.5
RDI= 91%, Z= 0.0	

NEPSY-2

AARS: AA Correct= 28, ss= 9
 Commissions= 2, 6-10th %ile
 Omissions= 2, 26th-50th %ile
 Combined ss= 8

RS Correct= 34, ss= 12

Commissions= 0, >75th %ile

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Omissions= 2, >75th %ile

Combined ss= 13

TOL-DX

TMS= 98 TCS= 104

RVS= 104 TVS= 114

IT= 90 ET= 106 PST= 108

Vineland-3

COM= 99

DLS= 94

SOC= 100

MOT= 111

ABC= 96

Int= 17 / Ext= 17

BASC-3

PRS Ext= 66 Int= 53 BSI= 57 Adap= 59

Conclusions

Emir has an unclear history of lead exposure. He did live within the known distribution of contaminated water in relation to the change in the Flint, MI water system to the Flint River (Hanna-Attisha, LaChance, Sadler, & Schnepp, 2016), but I am not aware of any objective evidence quantifying his lead exposure until 2016. At that time, he had a negative blood lead level, although the lower detectable limit for this test was fairly high, and this was well after the reversion of the Flint, MI water system to Detroit-supplied water. After that, in 2019, he did have an elevated bone lead level, so that there was evidence of cumulative exposure to lead at some time prior to 2019. There is no apparent evidence of any other source of likely lead exposure, and given that Emir did have exposure to contaminated water through the Flint water supply, there is no better or more likely explanation currently available for his elevated bone lead than as caused by the Flint water supply.

His family's complaints are a little inconsistent – when deposed, Emir's mother variably indicated that his father was concerned about his high activity level, or that she was. He does appear to have at least one injury that was driven by impulsive behavior and documented in medical records I had to review. When I spoke to them for this evaluation, they did acknowledge focus problems, although they downplayed them. I think this might have been some mild positive impression management (that is, a natural tendency to want their child to be seen in the best possible light), and when I had them respond to a standardized questionnaire that let me compare their experiences with those of the parents of other children Emir's age, they did endorse hyperactivity. In cognitive testing, Emir was intellectually normal, but he did have a pattern of subtle executive deficits that have to do with correct ability to appraise task difficulty and correctly allocate cognitive resources.

Clinically, his presentation is most consistent with mild attention-deficit/hyperactivity disorder (ADHD), presenting in Emir's case with more prominent symptoms of hyperactivity and impulsivity than

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inattention. There is no apparent, documented family history of this. ADHD is not uncommon in the general population, but it is known to occur with an elevated rate in children exposed developmentally to lead, and it is within the range of impairments established as consequences of lead neurotoxicity, even at low concentration levels (Mason, Harp, & Han, 2014; Lidsky & Schneider, 2003). In the absence of any evidence supporting any other potential cause of either Emir's lead exposure or his ADHD symptoms, it is more likely than not that his ADHD is a direct result of lead exposure through the Flint water system.

Diagnosis

Overall, my primary diagnostic impression is ADHD (F90.1), which is more likely than not a result of developmental lead exposure.

Recommendations

1. Intellectually, Emir is functioning in the broadly normal range. He has the general cognitive capacity to succeed, and he at present has fairly normal academics in my standardized testing, although in areas, such as in math, his impulsivity and lack of attention to detail do appear to limit his performance slightly. The findings at present do not support an immediate need for an individualized education plan (IEP), but it is common for milder cases of ADHD to not be apparent in school functioning until late elementary school, and there is a 25-50% chance that Emir will need an IEP in the future, to provide accommodations such as a private environment for testing, extended time for tests, use of a day planner, and training in "metacognitive" skills used to break down tasks or identify the demands in complex assignments. His appropriate placement is in a mainstream classroom, with some chance (probably also 25-50%) that he will require future tutor support of about one hour per day.
2. While IQ at the current age is not completely predictive of long-term outcome, individuals at this intellectual level are generally able to graduate from high school with a diploma. However, there is an elevated risk of high school dropout – even mild ADHD increases this risk 2-3-fold (Fredriksen, Dahl, Martinsen, *et al.*, 2014), to a risk of about 10-15% vs. 5% in the general population. Individuals at this intellectual level can likewise succeed at a two-year or four-year college, but there is a moderate possibility that his issues may prevent him from completing college or graduate training (likely 25-50% chance of dropout at the post-secondary level). There is, overall, also an increased risk of working below Emir's potential, such as preventing success in a skilled vocation (that is, reducing his work to simple, unskilled work below his potential if his attention and impulsivity issues were not a concern).

Attestation

I personally completed all aspects of this evaluation, which included: review of medical records, interview with and examination of the examinee, testing, integration, complex decision making and interpretation

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of results, and this report. I have no prior relationship with the examinee and am unaware of any conflicts of interest for this examination.



8/4/2020

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